

WHAT IS CLAIMED IS:

- 1 1. A method of protecting a conductor in a micromachined device, said
2 method comprising:
 - 3 providing a substrate for a micromachined device;
 - 4 providing a conductor as part of said micromachined device for use in
5 conducting electrical signals during operation of said micromachined device;
 - 6 providing a protective covering for said conductor so that said conductor is
7 disposed between said substrate and said protective covering.
- 1 2. The method as described in claim 1 wherein said protective covering
2 comprises polysilicon.
- 1 3. The method as described in claim 1 wherein said providing a
2 protective covering comprises depositing said protective covering as a layer of material.
- 1 4. The method as described in claim 3 wherein said layer of material
2 protects a plurality of conductors.
- 1 5. The method as described in claim 1 and further comprising:
2 electrically coupling said protective covering with said substrate so as to
3 configure a ground ring around said conductor.
- 1 6. The method as described in claim 1 and further comprising:
2 configuring said protective covering so as to form a tunnel relative to said
3 conductor.
- 1 7. The method as described in claim 1 and further comprising:
2 not depositing a passivation layer over an active mechanical component of
3 said micromachined device.
- 1 8. A micromachined device comprising:
2 a substrate;

3 a conductor configured as part of said micromachined device;
4 a protective covering disposed over said conductor so that said conductor is
5 disposed between said substrate and said protective covering.

1 9. The device as described in claim 8 wherein said protective covering
2 comprises polysilicon.

1 10. The device as described in claim 8 wherein said protective covering is
2 deposited as a layer of material.

1 11. The device as described in claim 10 wherein said layer of material
2 protects a plurality of conductors.

1 12. The device as described in claim 8 wherein said protective covering is
2 electrically coupled with said substrate so as to form a ground ring around said conductor.

1 13. The device as described in claim 8 wherein said protective covering is
2 configured so as to form a tunnel relative to said conductor.

1 14. The device as described in claim 8 wherein said device is configured
2 for operation without a passivation layer disposed over said conductor.

1 15. A method of protecting a conductor in a micromachined device, said
2 method comprising:

3 providing a micromachined device comprising a substrate;

4 providing a conductor as part of said micromachined device;

5 providing as part of said micromachined device a protective covering, wherein
6 said conductor is disposed between said protective covering and said substrate of said
7 micromachined device.

1 16. The method as described in claim 15 wherein said providing a
2 protective covering comprises utilizing polysilicon as said protective covering.

1 17. The method as described in claim 15 wherein said providing said
2 protective covering comprises depositing said protective covering as a layer of material.

1 18. The method as described in claim 17 wherein said layer of material
2 protects a plurality of conductors.

1 19. The method as described in claim 15 and further comprising:
2 electrically coupling said protective covering with said substrate so as to
3 configure a ground ring around said conductor.

1 20. The method as described in claim 15 and further comprising:
2 configuring said protective covering so as to form a tunnel relative to said
3 conductor.

1 21. The method as described in claim 15 and further comprising:
2 not depositing a passivation layer over an active mechanical component of
3 said micromachined device.

1 22. A micromachined apparatus comprising:
2 a substrate;
3 a bonding pad;
4 a conductor disposed over said substrate, wherein said conductor is electrically
5 coupled with said bonding pad;
6 an active mechanical component disposed over said substrate, wherein said
7 active mechanical component is configured to move relative to said substrate;
8 a protective cover disposed over said conductor so that said conductor is
9 disposed between said protective cover and said substrate.

1 23. The apparatus as described in claim 22 wherein said active mechanical
2 component comprises a mirror.

1 24. The apparatus as described in claim 23 wherein said mirror comprises
2 silicon.

1 25. The apparatus as described in claim 22 wherein said active mechanical
2 component is exposed to the atmosphere during operation of said apparatus.

1 26. The apparatus as described in claim 22 wherein a portion of said
2 conductor is exposed to the atmosphere during operation of said apparatus.

1 27. The apparatus as described in claim 22 wherein said protective cover
2 comprises an polysilicon.

1 28. The apparatus as described in claim 22 wherein said protective layer of
2 material is operable to protect said conductor from an electrical short when a voltage of at
3 least 100 Volts is applied to said protective layer of material.

1 29. The apparatus as described in claim 22 wherein said protective layer of
2 material is configured so as to form a ground ring with said substrate around said conductor.

1 30. The apparatus as described in claim 22 wherein said protective layer of
2 material is configured so as to form a tunnel relative to said conductor.

1 31. The apparatus as described in claim 22 wherein said apparatus is
2 configured for operation without depositing a passivation layer.

1 32. A method of providing a micromachined apparatus, said method
2 comprising:

3 providing a substrate;

4 disposing a bonding pad over said substrate;

5 disposing a conductor over said substrate, wherein said conductor is
6 electrically coupled with said bonding pad;

7 disposing an active mechanical component over said substrate, wherein said
8 active mechanical component is configured to move relative to said substrate during
9 operation of said micromachined apparatus;

10 disposing a protective cover over said conductor so that said conductor is
11 disposed between said protective covering and said substrate.

1 33. The method as described in claim 32 wherein said active mechanical
2 component comprises a mirror.

1 34. The method as described in claim 33 wherein said mirror comprises
2 silicon.

1 35. The method as described in claim 32 wherein said active mechanical
2 component is exposed to the atmosphere during operation of said micromachined apparatus.

1 36. The method as described in claim 32 wherein a portion of said
2 conductor is exposed to the atmosphere during operation of said micromachined apparatus.

1 37. The method as described in claim 32 wherein said protective cover
2 comprises polysilicon.

1 38. The method as described in claim 32 wherein said protective cover is
2 operable so as to protect said conductor from an electrical short when a voltage of at least 100
3 Volts is applied to said protective cover.

1 39. The method as described in claim 32 and further comprising:
2 electrically coupling said protective cover with said substrate so as to
3 configure a ground ring around said conductor.

1 40. The method as described in claim 32 and further comprising:
2 configuring said protective cover so as to form a tunnel relative to said
3 conductor.

1 41. The method as described in claim 32 and further comprising:
2 not depositing a passivation layer over an active mechanical component of
3 said micromachined apparatus.

1 42. A method of configuring a micromachined apparatus, said method
2 comprising:
3 providing a bonding pad as part of said micromachined apparatus;

4 providing an active mechanical component, wherein said active mechanical
5 component is configured to move during operation of said micromachined apparatus;

6 disposing a conductor between said active mechanical component and said
7 bonding pad;

8 protecting at least a portion of said conductor disposed between said active
9 mechanical component and said bonding pad with a protective layer of material operable to
10 protect said conductor from electrical shorts.

1 43. The method as described in claim 42 wherein said providing an active
2 mechanical component comprises providing a mirror.

1 44. The method as described in claim 42 and further comprising
2 configuring said active mechanical component so as to be exposed to the atmosphere during
3 operation of said micromachined apparatus.

1 45. The method as described in claim 42 wherein said protective layer of
2 material protects said conductor when a voltage of at least 100 Volts is applied to said
3 protective layer of material.

1 46. The method as described in claim 42 and further comprising:
2 configuring said protective layer of material so as to form at least part of a
3 ground ring around said conductor.

1 47. The method as described in claim 42 and further comprising:
2 configuring said protective layer of material so as to form a tunnel relative to
3 said conductor.

1 48. The method as described in claim 42 and further comprising:
2 not depositing a passivation layer over said active mechanical component.

1 49. A micromachined apparatus comprising:
2 a bonding pad;

3 an active mechanical component configured to move during operation of said
4 micromachined apparatus;

5 a conductor disposed between said active mechanical component and said
6 bonding pad;

7 a covering configured so as to protect at least a portion of said conductor
8 disposed between said bonding pad and said active mechanical component from electrical
9 shorts.

1 50. The micromachined apparatus as described in claim 49 wherein said
2 active mechanical component comprises a mirror.

1 51. The micromachined apparatus as described in claim 49 wherein a
2 portion of said conductor is exposed to the atmosphere during operation of said
3 micromachined apparatus.

1 52. The micromachined apparatus as described in claim 49 wherein said
2 covering is configured so as to protect said conductor when a voltage of at least 100 Volts is
3 applied to said covering.

1 53. The micromachined apparatus as described in claim 49 wherein said
2 covering is configured so as to form at least part of a ground ring around said conductor.

1 54. The micromachined apparatus as described in claim 49 wherein said
2 covering is configured so as to form a tunnel relative to said conductor.

1 55. The micromachined apparatus as described in claim 49 wherein said
2 micromachined apparatus is configured without depositing a passivation layer.

1 56. A method comprising:

2 providing a substrate;

3 disposing a conductor over said substrate operable for conducting electrical
4 signals;

5 configuring an equipotential barrier at least partially around said conductor
6 operable for protecting said conductor from electrical shorts.

1 57. The method as described in claim 56 wherein said configuring an
2 equipotential barrier comprises:

3 depositing polysilicon over said conductor; and
4 electrically coupling said polysilicon with said substrate so as to form an
5 equipotential ring.

1 58. The method as described in claim 57 and further comprising:
2 electrically coupling said equipotential ring to a circuit ground.

1 59. The method as described in claim 56 wherein said configuring an
2 equipotential barrier comprises:
3 configuring a tunnel of electrically conductive material over said conductor;
4 and
5 coupling said electrically conductive material with said substrate.

1 60. The method as described in claim 59 and further comprising:
2 electrically coupling said equipotential barrier to a circuit ground.

1 61. An apparatus comprising:
2 a substrate;
3 a conductor disposed over said substrate, said conductor operable for
4 conducting electrical signals;
5 an equipotential barrier disposed at least partially around said conductor and
6 operable for protecting said conductor from electrical shorts.

1 62. The apparatus as described in claim 61 wherein said equipotential
2 barrier comprises polysilicon; and
3 wherein said polysilicon is electrically coupled with said substrate so as to
4 form an equipotential ring.

1 63. The apparatus as described in claim 62 wherein said equipotential ring
2 is configured for coupling to a circuit ground during operation of said apparatus.

1 64. The apparatus as described in claim 61 wherein said equipotential
2 barrier comprises a conductive material configured as a tunnel over said conductor; and
3 wherein said conductive material is electrically coupled with said substrate.

1 65. The apparatus as described in claim 64 wherein said equipotential
2 barrier is configured for coupling to a circuit ground during operation of said apparatus.